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(19)(CA) **APPLICATION FOR CANADIAN PATENT** (12)

(54) Hockey Stick

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(73) Same as inventor

(57) 3 Claims

Canada

ABSTRACT

A hockey stick having a fibre-glass, hollow box beam filled with semi-rigid plastic foam and having a hockey blade adapted to fit snugly within the shaft by means of a pin located in the blade which connects with a hole in the shaft.

HOCKEY STICK

Field of the Invention

This invention relates to a hockey stick but more particularly to a fibreglass hockey stick having a detachable blade.

Background of the Invention

In the prior art there has been substantial amount of research and development with the object of providing a hockey stick that would retain the feel and general characteristics of a wooden hockey stick but which would provide better strength and less breakage. More recently, there have been developments with a view to enabling the owner of the stick to replace a broken blade without having to replace the whole stick.

The most relevant prior art of which the inventor is aware at the date of this application is the following:

U.S. patent 3,638,942, 02/01/72, Bassett

U.S. patent 3,677,542, 07/18/72, Michaud

U.S. patent 3,934,875, 01/27/76, Easton et al.

U.S. patent 4,076,240, 02/28/78, Haddad

U.S. patent 4,086,115, 04/25/78, Sweet, Jr. et al.

U.S. patent 4,124,208, 11/07/78, Burns, et al.
al.

U.S. patent 4,134,587, 01/16/79, Diederich

U.S. patent 4,148,482, 04/10/79, Harwell, Jr. et al.

U.S. patent 4,159,114, 06/26/79, Ardell et al.

U.S. patent 4,172,594, 10/30/79, Diederich et al.

U.S. patent 4,180,413, 12/25/79, Diederich et al.

U.S. patent 4,200,479, 04/29/80, Ardell et al.

U.S. patent 4,343,468, 08/10/82, Lindgren et al.

U.S. patent 4,353,549, 10/12/82, Goupil et al.

U.S. patent 4,358,113, 11/09/82, McKinnon et al.

U.S. patent 4,537,398, 08/27/85, Salminen

U.S. patent 4,684,130, 08/04/87, Drolet et al.

U.S. patents 3,677,542; 4,134,587; 4,148,482; 4,159,114; 4,172,594; 4,180,413; 4,200,479; 4,353,549; 4,537,398 and 4,684,130 disclose methods of manufacturing hockey sticks with improved characteristics due to the method of jointing the shaft to the blade, the addition of strips of plastic reinforcing material in the shaft and blade and the selection of the densities of the wood in the different parts of the hockey stick.

More pertinent to the present invention are U.S. patents 3,638,942; 3,934,875; 4,076,240; 4,086,115; 4,124,208; 4,343,468 and 4,358,113 which are directed to hockey sticks having detachable blades.

It is also known to the applicant that a hockey stick has been recently introduced with an aluminium shaft and a replaceable blade in which the shaft is heated to expand for insertion or removal of the blade. The blade is held into the shaft by means of the frictional force created by the contraction of the blade when the heat is removed and by means of glue.

It will be apparent to a person skilled in the art that much of the research and development in this area has gone into the selection of materials for the shaft and blade components of the hockey stick. The selection of materials is important in this manufacture to provide a hockey stick with the weight and feel similar to a wooden hockey stick but to provide other improved physical characteristics not available from conventional wooden sticks. It will also be apparent that a substantial effort has gone into the development of joints to fasten a blade to a shaft to provide sufficient strength characteristics. In the case of the second group of patents the jointing problem is complicated by the addition of the feature of a detachable blade.

The present invention is directed to a new combination of materials and fastening which provides an improved hockey stick having characteristics similar to that of a wooden hockey stick but permitting simple detachment of the blade from the shaft for replacement.

Statement of the Invention

The present invention is a hockey stick comprising a fibreglass shaft and a detachable blade. The shaft has a hollow fibreglass outer shell with four walls and is approximately rectangular in cross-section. The hollow fibreglass shell is filled with semi-rigid plastic

foam from one end of the shell to a foam end point located a short distance from a second end of the shell. At least one wall of the shell is pierced by at least one hole located between the foam end point and the second end of the shell. The detachable hockey blade has a playing surface and a hosel shaped to fit snugly within the second end of the hollow shell of the shaft. At least one snap fit lug is embedded in the hosel and spring biased to snap into the hole(s) in the wall(s) of the hollow shell to lock the hosel in the shaft.

The word "hosel" in this specification is intended to mean a stem or shaft extending from a heel portion at the rear of the blade playing surfaces that continues upwards at an angle to connect with the shaft. Generally the cross-section of the hosel will enlarge from the heel of the blade (where it will be as thick as the blade playing surface portion) until it is similar to the rectangular shape of the shaft. It will also have a fitting portion about 9" in length which is attenuated sharply at a shoulder. The fitting portion fits snugly within the hollow shaft. The shoulder abuts against the second end of the shaft when it completely inserted.

FIGURES

In the drawings which illustrate the preferred embodiment of this invention,

Figure 1 is an illustration of the two piece hockey stick of this invention;

Figure 2 is an illustration of the manner of attachment of the blade to the shaft;

Figure 3 is a detail illustrating the fastening pin and catch of the preferred embodiment of this invention;

Figure 4 is a cross section of the fibreglass hockey stick shaft of the preferred embodiment of this invention.

Description of the Preferred Embodiment

In the figures which illustrate the preferred embodiment of this invention, like numerals indicate like elements.

The hockey stick 1 of this invention comprises a shaft 2 and a blade 3. In cross-section, as shown in Fig. 4, the shaft 2 is a fibreglass box beam 4 filled with a polyurethane foam 5 throughout the length of the shaft 2 except in the vicinity of the attachment end 6 (sometimes referred to as the "second end") of the shaft 2 which is left open to receive the blade 3.

The fibreglass box beam shaft provides excellent strength and wear characteristics and provides a feel closer to that of wood than metal, such as aluminium for example. It will also be appreciated that the flexibility and strength characteristics of the shaft may be readily

adapted by changing the wall thickness of the box beam 4 and by varying the characteristics of the polyurethane foam 5. Accordingly, this construction provides a manufacturer with the ability to manufacture a range of hockey stick shafts which have different characteristics of strength, flexibility and weight but which outwardly look exactly similar.

The blade 3 comprises a playing surface portion 10 and a hosel 11. The hosel 11 in the preferred embodiment has an outer dimension similar to the outer dimension of the shaft 2. The attachment end 12 of the blade is attenuated to fit within the attachment end 6 of the shaft 2. A shoulder 13 abuts against the end of the shaft 2 upon attachment. Disposed in one side of the attachment end 12 is a spring biased pin 14. The attachment end of the shaft 6 has a hole 15 positioned to overlie the pin 14 when the blade is inserted into the shaft. The spring biased pin 14 then protrudes into hole 15 in order to fasten the two parts together.

Figure 3 illustrates a detail of the fastening pin 14 when the two parts are attached. As illustrated in Figure 3, the fastening pin 14 is spring biased by spring 20. The spring 20 and pin 14 combination are inserted in a drilled well 21 and seated against a plug 22 inserted into the well 21 after the spring 20. The top of the well 21 has an inwardly depending lip 31 adapted to act as a stop against shoulder 30

of the pin so as to limit the outward projection of the pin 14 so that its top surface lies flush with the top surface of the attachment end 6 of the shaft 2. When it is desired to separate the two parts, a tool such as a screwdriver may be used to depress the pin 14 into the well 21 below the inside surface of the attachment end 6 of the shaft 2. With the pin 14 thus depressed, the attachment end 6 of shaft 2 may be slid backwards over the top surface of pin 14 to retain it in well 21. The tool used to depress the pin 14 may then be removed and the shaft 2 and the blade 3 may be pulled apart. When one wishes to attach a new blade 3, the attachment end 12 of the blade 3 is inserted within the attachment end 6 of the shaft 2 and advanced until the pin 14 abuts against the end of the shaft 2. A tool may then be used to depress pin 14 until it is flush with the surface of the attachment end 12 of the blade 3. The blade may then be pushed further into the shaft 2 until the pin 14 snap fits into the hole 15 under the force of the spring 20.

The blade 3 of the hockey stick of this invention may be manufactured as an ordinary wooden blade of a traditional hockey stick except having the characteristics of the hosel as described above. Therefore, it is possible for the hockey player to have all the advantages of a wooden blade for playing hockey but permitting the hockey player to quickly replace the blade should it become broken.

It will be appreciated by those skilled in the art that it would be also possible to use the attaching mechanism of this invention with blades of other construction such as plastic blades. It would also be possible to use blades different than those used in ice hockey, e.g. those used for street hockey or for floor hockey. It would therefore be possible for a player using the hockey stick of this invention to use a wooden blade for ice hockey, to remove that blade and replace it with a plastic blade for road hockey or to replace it with a blade more suitable for floor hockey.

It will be appreciated that the above description is intended to be illustrative of the features of the preferred embodiment of this invention. The claims set out below define the full scope of the invention.

What is claimed is:

1. A hockey stick comprising;

a shaft having a fibreglass hollow box beam with four walls filled with semi-rigid plastic foam from one end of the shaft to a foam end point located a short distance from a second end of the shaft and having at least one wall pierced by a hole located between the foam end point and the said second end,

a hockey blade having a hosel shaped to fit snugly within the second end of the shaft and

at least one pin in the hosel located to align with and spring biased to snap into the said hole(s) in the wall(s) of the shaft releaseably to lock the blade hosel in the shaft.

2. The hockey stick of Claim 1 in which the hosel has a heel portion, a shoulder and an attachment portion in which the attachment portion fits snugly into the shaft and the shoulder portion abuts the second end of the shaft.

3. The hockey stick of Claims 1 or 2 in which each pin is contained in a well embedded in the hosel with a well opening facing outward of the hosel, said well having a spring to bias the pin outward,

said pin having a bottom end with a stop that interacts with the well opening to stop the bottom end of the pin within the well.

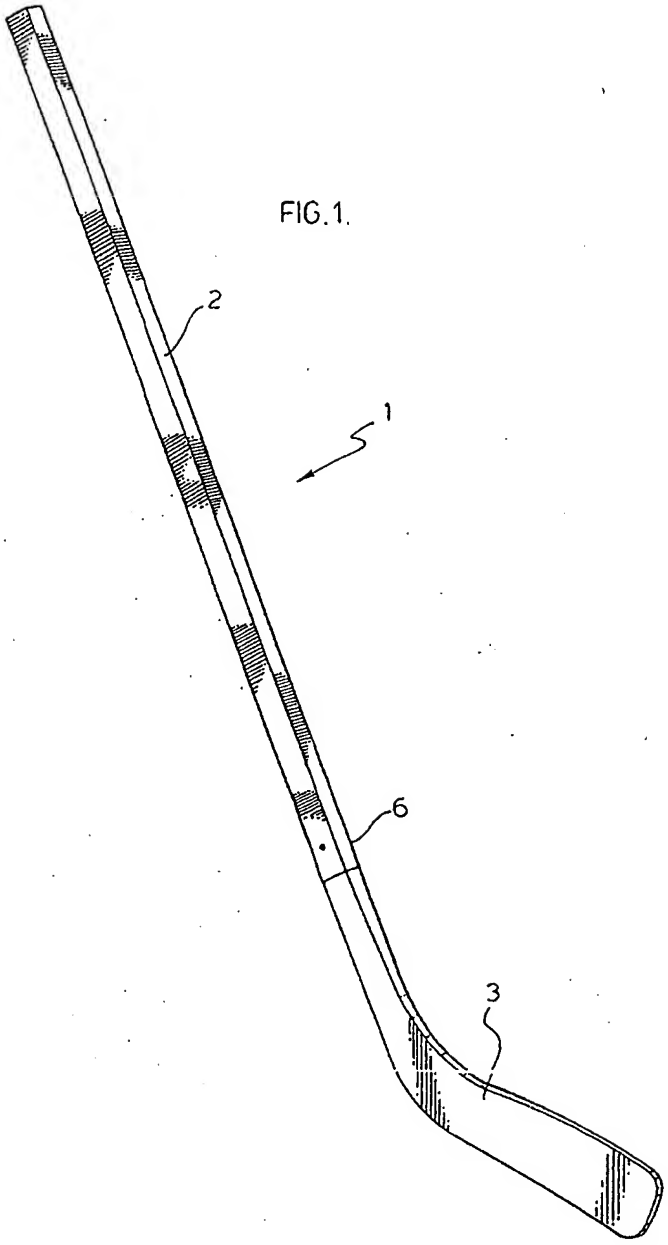
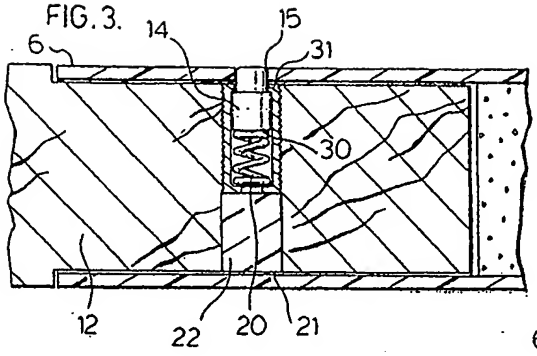
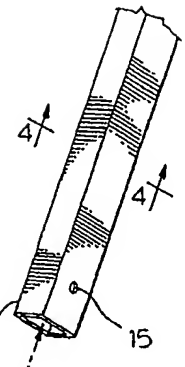


FIG.1.

FIG. 3.





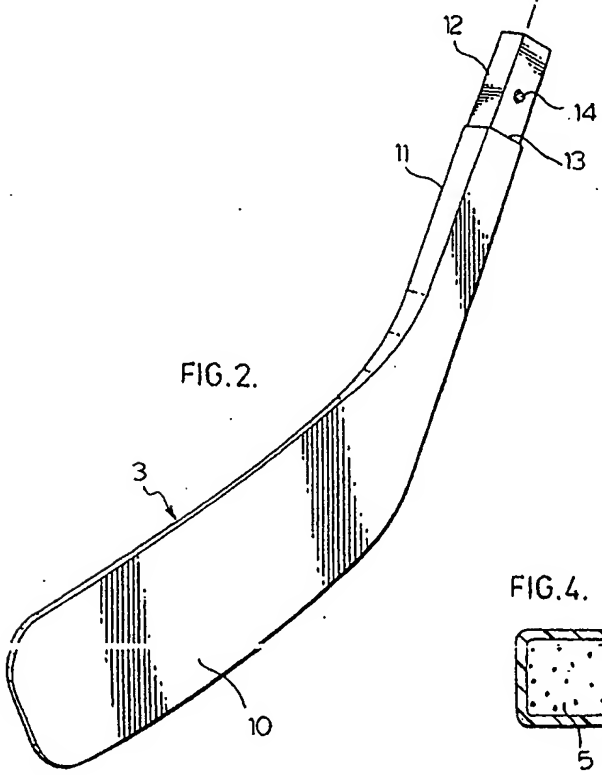


FIG. 2.

FIG. 4.